

WHAT IS CLAIMED IS:

1           1. Method for providing a sensor system in a communication device  
2 comprising the steps of:

3                 providing an electromechanical dielectric (EMD) film integral with  
4 the surface of the cover of the communication device;

5                 providing one or more voided areas in the outer surface regions in the  
6 cover for accessing the EMD film wherein the voided area corresponds to  
7 the operational function to be implemented; and

8                 coupling the EMD film in each of the exposed regions to electronic  
9 circuit means associated with the corresponding operational function of the  
10 communication device.

1           2. The method as defined in claim 1, wherein the step of providing one  
2 or more voided areas in the outer surface region includes providing one or  
3 more voided areas in the inner surface region of the cover in those areas  
4 where the EMD film requires unobstructed movement to perform the desired  
5 operational function of transforming an acoustic energy signal to a  
6 corresponding electrical signal and transforming an electrical signal to a  
7 corresponding acoustic signal.

1           3. The method as defined in claim 1, further including the step of  
2 providing a display in one of the voided areas with the rear surface of the  
3 display facing and in contact with the EMD film.

1           4. The method as defined in claim 1, wherein the step of providing the  
2 EMD film integral with the surface of the cover includes the step of injection  
3 molding the cover with the EMD film.

- 1 5. A communication device comprising:  
2 an electromechanical dielectric (EMD) film coextensive with at least  
3 a portion of the surface of a cover of the communication device;  
4 one or more voided areas in the outer surface regions in the cover for  
5 accessing a portion of the EMD film wherein a given voided area in the  
6 surface of the cover corresponds to the operational function to be  
7 implemented;  
8 electronic circuit means coupled to the EMD film for sensing  
9 electrical signals generated by the EMD film in response to exposure to a  
10 force and for displacing the surface of the EMD film with respect to a plane  
11 passing through and coextensive with the surface in response to electrical  
12 signals generated by the electronic circuit means.
- 1 6. A communication device as defined in claim 5, wherein the EMD  
2 film functions as a speaker.
- 1 7. A communication device as defined in claim 5, wherein the EMD  
2 film functions as a microphone.
- 1 8. A communication device as defined in claim 5, wherein the EMD  
2 film functions as a keypad.
- 1 9. A communication device as defined in claim 5, further comprising a  
2 display in contact with the EMD film whereby the EMD film is responsive  
3 to sensing a direction of touching on the surface of the display.

1 10. A portable, handheld communication device of the type having means  
2 for establishing a communication link between itself and a remote  
3 communication device comprising:

4 a case having at least a first portion molded from material responsive  
5 to displacement for generating an electric signal; and

6 at least a second portion molded from material responsive to electric  
7 signals for displacement of said material proportional to the magnitude of the  
8 electrical signal.

1 11. A portable, handheld communication device as defined in claim 10,  
2 wherein said first portion and said second portion are molded from  
3 electromechanical dielectric (EMD) film, said EMD film being coextensive  
4 with at least a portion of the surface of said case.

1 12. A portable, handheld communication device as defined in claim 11  
2 further including security means for controlling access to said device and  
3 limiting call completion to an authorized user.

1 13. A portable, handheld communication device as defined in claim 12  
2 wherein said security means further includes at least a portion of said EMD  
3 film configured as a fingerprint recognition sensor

1 14. A method for providing a touch-sensitive surface functionality in a  
2 communication device comprising the steps of:

3 providing an electromechanical dielectric (EMD) film with a first  
4 major surface having adhesion properties;

5 placing said first adhesion major surface in contact with a desired  
6 location of a surface of the communication device; and

7 coupling the EMD film to electronic circuit means associated with the  
8 corresponding operational function of the communication device.

1 15. The method as defined in claim 14, further including the steps of:  
2 providing an EMD film with a second major surface disposed  
3 opposite said first major surface, said second major surface having adhesion  
4 properties; and  
5 locating the EMD film between the cover of the device and a display  
6 screen of the device, whereby the EMD film holds the display in place to  
7 provide a touch-sensitive screen.

1 16. The method as defined in claim 14, further including the steps of:  
2 providing an EMD film with a second major surface disposed  
3 opposite said first major surface;  
4 providing a flexible protective layer on said second major surface;  
5 and  
6 attaching the adhesion major surface of the EMD film to a desired  
7 location on the surface of the device, whereby the protective layer faces  
8 outward for touching contact by a user.

1 17. A communication device having touch-sensitive surface functionality  
2 comprising:  
3 an electromechanical dielectric (EMD) film with a first major surface  
4 having adhesion properties and a second major surface oppositely disposed  
5 said first major surface, whereby said adhesion major surface holds said  
6 EMD film in contact with a desired location on the surface of the  
7 communication device; and

8 means for coupling said EMD film to electronic circuit means  
9 associated with the corresponding operational function of the communication  
10 device.

1 18. A communication device as defined in claim 17, further comprising:  
2 said EMD film second major surface having adhesion properties; and  
3 a display in contact with and held by said EMD film second major  
4 surface.

1 19. A communication device as defined in claim 17, further comprising a  
2 said EMD film second major surface having a flexible protective layer.